

What Is Claimed Is:

1. A method of manufacturing a substrate for a liquid-crystal display device comprising the steps of:
  - forming a resin layer on a substrate;
  - 5 selectively reforming the surface portion of said resin layer by applying energy with an energy density per unit time of a prescribed value or more to said resin layer to generate a difference in a rate of thermal shrinkage between said surface portion and the layer portion other than the surface
  - 10 portion in said resin layer;
  - performing a heat treatment to said resin layer to form undulations in said surface portion; and
  - forming reflective electrodes on said surface portion.
- 15 2. The method of manufacturing a substrate for a liquid-crystal display device according to claim 1,
  - wherein said energy is applied by irradiation with light.
3. The method of manufacturing a substrate for a liquid-
- 20 crystal display device according to claim 2,
  - wherein said energy is applied by irradiation with ultraviolet rays.
4. The method of manufacturing a substrate for a liquid-
- 25 crystal display device according to claim 3,
  - wherein said energy is applied by irradiation with said ultraviolet rays with an illuminance exceeding  $12 \text{ mW/cm}^2$ .

5. The method of manufacturing a substrate for a liquid-crystal display device according to claim 3,

wherein said energy is applied by irradiation with said  
5 ultraviolet rays with an illuminance of no more than 12  
mW/cm<sup>2</sup> and said resin layer is in a semi-hardened condition  
prior to the application of said energy.

6. The method of manufacturing a substrate for a liquid-  
10 crystal display device according to claim 5,

wherein heat treatment of said resin layer is performed  
at a prescribed temperature prior to the application of said  
energy.

15 7. The method of manufacturing a substrate for a liquid-  
crystal display device according to any of claims 1 to 6,

wherein photosensitive resin is employed for said resin  
layer.

20 8. The method of manufacturing a substrate for a liquid-  
crystal display device according to claim 7,

wherein novolac resist is employed for said resin layer.

9. A method of manufacturing a liquid-crystal display device  
25 in which a pair of substrates are manufactured and said  
substrates are mutually stuck together so that liquid-crystal  
is sealed between said substrates, wherein

one of said substrates is manufactured using a method of manufacturing a substrate for a liquid-crystal display device according to any of claims 1 to 8.

- 5 10. A method of manufacturing a substrate for a liquid-crystal display device comprising the steps of:

coating a resin layer on a substrate, wherein the resin layer can be at least three conditions including a non-harden condition, a semi-harden condition and a harden condition

- 10 through a heat treatment;

performing a first heat treatment to the resin layer to make the resin layer the harden condition or the semi-harden condition;

- 15 applying energy having a energy density per a unit time, which is more than a prescribed value, to the resin layer so as to selectively reform the surface portion of said resin layer and to generate a difference in a rate of thermal shrinkage between said surface portion and the layer portion other than the surface portion;

- 20 performing a second heat treatment to the resin layer to form undulations in said surface portion; and

forming a reflective electrode on said surface portion.

11. The method of manufacturing a substrate for a liquid-crystal display device according to the claim 10,

25 wherein, in said first heat treatment, the semi-harden condition is made by a first pre-bake treatment with from 80

to 130 degrees centigrade, the harden condition is made by the first pre-bake treatment and a second pre-bake treatment, and

the energy having a energy density per a unit time,  
5 which is more than a prescribed value, is given by an irradiation of ultra-violet light whose energy density per a unit time is more than  $12 \text{ mW/cm}^2$ .

12. A method of manufacturing a substrate for a liquid-  
10 crystal display device comprising the steps of:

coating a resin layer on a substrate, wherein the resin layer can be at least three conditions including a non-harden condition, a semi-harden condition and a harden condition through a heat treatment;

15 performing a first heat treatment to the resin layer to make the resin layer the semi-harden condition;

applying energy having a energy density per a unit time, which is no more than  $12 \text{ mW/cm}^2$ , to the resin layer so as to selectively reform the surface portion of said resin layer  
20 and to generate a difference in a rate of thermal shrinkage between said surface portion and the layer portion other than the surface portion;

performing a second heat treatment to the resin layer to form undulations in said surface portion; and

25 forming a reflective electrode on said surface portion.

13. The method of manufacturing a substrate for a liquid-

wherein, in said first heat treatment, the semi-harden condition is made by a first pre-bake treatment with from 80 to 130 degrees centigrade.